

10/58494

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 August 2005 (18.08.2005)

PCT

(10) International Publication Number
WO 2005/075802 A1

(51) International Patent Classification⁷: **F02D 35/02**,
G01M 15/00

Shigeki [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1,
Toyota-cho, Toyota-shi Aichi 471-8571 (JP).

(21) International Application Number:
PCT/JP2005/002188

(74) Agent: **PROSPEC PATENT FIRM**; 12th Floor,
Nagoya-KS Building, 1-18, Taiko 3-chome, Nakamura-ku,
Nagoya-shi, Aichi 453-0801 (JP).

(22) International Filing Date: 8 February 2005 (08.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2004-32950 10 February 2004 (10.02.2004) JP

(71) Applicant (for all designated States except US): **TOY-
OTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toy-
ota-cho, Toyota-shi, Aichi 471-8571 (JP).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG,
KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

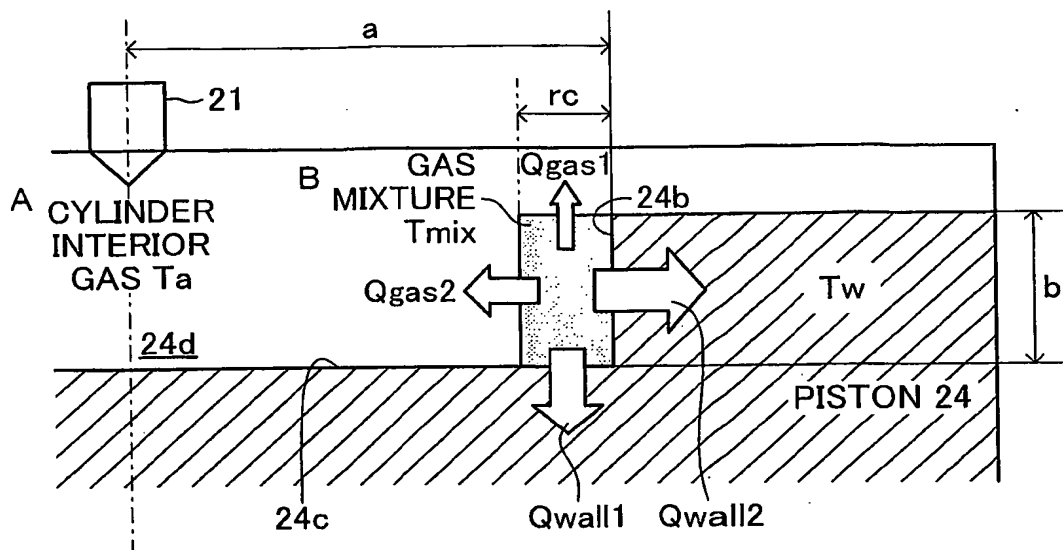
(72) Inventors; and

(75) Inventors/Applicants (for US only): **IBUKI, Taku**
[JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toy-
ota-cho, Toyota-shi Aichi 471-8571 (JP). **NAKAYAMA,**

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,

[Continued on next page]

(54) Title: METHOD OF ESTIMATING TEMPERATURE OF GAS MIXTURE FOR INTERNAL COMBUSTION ENGINE



(57) Abstract: In a gas mixture temperature estimation method for an internal combustion engine, before a forefront portion of a gas mixture reaches an inner wall surface of the combustion chamber, the gas mixture temperature is calculated in accordance with a predetermined equation which is based on the assumption that no head exchange occurs between the gas mixture and cylinder interior gas which exists around the gas mixture without mixing with fuel. After the gas mixture forefront portion reaches the inner wall surface of the combustion chamber, the gas mixture temperature calculated in accordance with the equation is corrected in consideration of the quantity of heat transfer between the gas mixture and the cylinder interior gas and the quantity of heat transfer between the gas mixture and the wall.

WO 2005/075802 A1